SUPPLEMENT.

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Original Correspondence.

THE MIDLAND COAL FIELD.

THE BARNSLEY SEAM.

Of the various coal fields in the kingdom that known as "The Midland" is the largest as well as the most valuable, comprising as it does an area of upwards of 1100 square miles, or nearly one-fourth of the whole of the coal-bearing strata in England and Wales. Commencing in Nottinghamshire, and running into Derbyshire and Yorkshire, the Midland seams are worked nearly 70 miles in a straight line. Of those seams that known as the "Barnsley" is the most extensively raised, in some places being more than 9 ft. in thickness, and combining both hard and soft coal. It is worked at its southern extremity near to Nottingham, and at its northern beyond Normanton. Unlike the Durham and South Wales coal fields, the Midland is not by any means defined or explored, and as yet is in comparative infancy, seeing that until the railway system came into operation it was almost unknown in the southern counties, for we find that in 1833 the quantity of coal imported into London from Yorkshire was only 16,050 tons, and in 1846 it was but 25,667 tons. In 1850 the Great Northern commenced carrying coal to the metropolis, and in that year it was credited with 4944 tons, whilst in the same period there was sent by water from Yorkshire 18,784 tons. The Midland Railway led to the opening out of the Derbyshire collieries, before which not a ton of coal was sent over the ridge of Clay Cross, but there is now sent to London alone from there upwards of 400,000 tons annually. Dronfield at one time supplied a good deal of coal to Sheffield, from which it is distant about six miles; but the growth of the hardware town required larger supplies, and pits were sunk near to it. Sheffield, it may be said, has been noted for its cutlery for more than 500 years, for Chaucer, the father of English poetry, in describing his Miller of Trumpington, says, "a Shefield thwytel in his hose he bore," but the "thwytels," as well as the metal, would be made with charcoal. The town at that time must have been a very small place, for so recently as 1736 the population was only 2695. In 1846 however, the consumption of coal in Sheffield was 820,000 tons. In the same year an effort was made to have Sheffield put in direct railway communication north and south, instead of being a mere branch on the Midland system, when it was stated in a memorial that "it has been proved that coal is the cheapest in the town of Barnsley of any place in the kingdom, and one of the richest seams known is there, being of the unparalleled thickness of 9 feet, the price being 4s. per ton." In the Barnsley district, however, the seam until some 60 or 70 years ago was only worked at the outcrop, there being no inducements to sink to any depth, as there was no outlet for the coal were it raised. The opening out of a canal in the first instance gave the opportunity for sending coal so as it could reach the port of Hull, and by way of the river Dun to Thorne and Doncaster. The river at one time was not navigable at the upper part of it, but in the year 1722 a scheme was brought out for making it so that vessels could ply between Doncaster and Sheffield. An Act for that purpose was obtained in 1726, and the Corporation of Doncaster and the Cutlers' Company of Sheffield were appointed trustees. The two bodies, however, declined the honour, and the powers granted in the first instance were transferred to a company of 150 proprietors, who each had a 100*l.* share, and by that means the river was made navigable, and facilities given for the transport of coal and other merchandise. The property is now a valuable one, each share constituting a freehold. A share sold in 1832 realised 2160*l.*, but now, probably, would fetch double that amount, or nearly so.

In the southern part of the Midland field, the Barnsley or "upper hard" seam is worked close to Nottingham. At Cinder Hill, 3 miles from Nottingham, it is composed of three beds—the lower one being about 5 feet thick, then a band or seam of dirt of 6 in., a seam of bright soft coal of 15 in., a band of dirt 6 in., and another seam of coal 15 in. thick. A short distance from Cinder Hill the upper beds are separated from the lower part for several yards, but the upper bed of dirt is wanting, and the two upper beds form a solid seam of 3 feet. Another change takes place a little further northward at Skegby, where the upper beds are entirely wanting. At Portland Colliery there is another change, there being a falling off in the thickness of the coal, the band of dirt changing and becoming stronger and more laminated, and the upper bed being of no value. The next change takes place at Staveley, where the coal is of a superior quality. It is reached at a depth of 157 yards, and is about 6 feet in thickness. There is no separation between the beds, the section being as follows:—Top or upper soft 1 foot, hard 3 feet; lower soft, in which there is an inferior cannel known as branch coal, 2 feet, making a total of 6 feet. A few miles from Staveley we come to that great formation the magnesian limestone, under which at one time it was thought no coal would be found. That, of course, was a fallacy, for at Shireoaks, on the estate of the Duke of Newcastle, the limestone was sunk through to the Barnsley coal seam. A bore-hole was first sunk to a depth of 300 yards, but no coal or ironstone of any value was come to. The magnesian limestone was found divided into two beds, the top, yellow, hard and crystalline, 54 feet thick, and the blue below it, containing bands of shale, 20 feet thick. The top hard coal was reached at a depth of 510 yards, and was only about 3 feet 10 in. in thickness. The following is a section—soft, 10 in.; hard, 10 in.; bright, 3 in.; mixed hard and soft, 12 in.; and soft, 11 in. Unlike the collieries in the northern part of the field, so little gas is given off at Shireoaks that the men are able to work with naked lights. The sinking through the limestone has clearly proved what most mining engineers were agreed upon, that the top hard coal thins out towards the east under that formation.

Proceeding from Shireoaks we come to the Barnsley district, where the seam altogether is more uniform in quality and thickness, as well as more valuable, than in any part of the entire coal field. It also makes the most gas, a proof sufficiently demonstrated by the many fearful explosions which have taken place in it. The deepest pit in the South Yorkshire district is Denaby Main, about 450 yards deep; the seam of coal also being about the thickest worked. The following is the section—coal, 1 foot 2½ in.; dirt, 6 in.; coal, 5 feet 5½ in.; actual thickness 9 feet 8 in. Or, to give it more in detail—day bed, or bags, 1 foot 2½ in.; clod, 6 in.; soft, 1 foot 5 in.; clay seam, 1 ft. 4 in.; hard, 3 feet 3 in.; soft, 7 in.; dirt, 1 in.; bottom soft, 1 foot 11 in.: total 9 feet 8 in. In the same locality as Denaby, the Barnsley bed is met with at varying depths, and of different thicknesses. The Oaks Colliery is about 293 yards deep, coal 8 feet 8 in. thick; Darfield Main 337 yards, coal 8 feet thick; Craik's 161 yards, coal 9 feet 6 in. thick; Mount Osborne 192 yards, coal 9 feet 3 in. thick; Thrybergh Hall 288 yards, coal 7 feet 8 in. thick; Swaithe Main 230 yards, coal 8 feet 6 in. thick; and Wombwell Main 224 yards, coal 7 feet 11 in. thick.

The Barnsley seam crops out quite close to the town it is named after; and so near to the surface has it been worked, that a short time ago a horse yoked to a plough fell through into the workings of the Messrs. Greave's colliery. Had it been later on in the year it is quite probable, as was once said to be the case in the district, that the hurrier on some occasions might have found one of his corfs with a full load of turnips instead of coal waiting to be taken out, as the result of a "fall."

Of the quality of the coal the following may be taken as an average of that raised in the Barnsley district:—

	Steam coal.	House coal.
Ash per cent	1·73	2·37
Sulphur	·61	·82
Moisture	3·17	3·96
Coke per cent.	64·28	63·06
Volatile matter	35·72	36·84
Total	100·00	100 00

The ash of the sample analysed of steam coal was nearly white, having a slight pinkish tinge; it was difficultly fusible, contained only a trace of sulphide of iron. From the purity of the steam coal—the analyst states—it is well adapted for steam purposes, being free from iron pyrites, whilst the infusibility of the ash prevents it from clinkering. The following is an analysis of a sample of coke from the same coal:—

	Coke.
Carbon	86·89
Ash	11·31
Sulphur	1·41
Moisture	·39=100·00

Ash rather bright, red in colour, fusible and alkaline, not containing any sulphate of iron.

As before stated, a great deal of gas is made in the pits in the northern part of the coal field. At the last catastrophe no less than 360 persons having been killed. Such accidents, however, during the last three or four years have been unknown in the district; and with the improved means of ventilation and greater care on the part of the men, we believe that they are not likely to take place.

In conclusion, we may say, from the great extent of the Midland coal field, and the many valuable workable seams it contains, hundreds of years must elapse before even the question as to its probable duration will be mooted; whilst the advantageous position it occupies by its proximity to all the great iron manufacturing centres, as well as to the metropolis, will always ensure for its produce the largest and best markets.

COLLIERIES IN NORTH DURHAM, THEIR WORKINGS AND MACHINERY—No. XVIII.

South Hetton and Murton Collieries.—The lessees of these well-known collieries are Messrs. Forster and Partners; about 6000 acres of mineral property is attached to them. The collieries are under the management of Mr. R. F. Matthews. The mineral properties are all covered by the magnesian limestone and new red sandstone formations, bounded by those of Seaham and Seaton on the north, Hetton on the west, Haswell and Shotton on the south, and they extend to the German Ocean on the east.

South Hetton Colliery.—One pit is sunk to the Hutton seam, 15 ft. in diameter, 181 fms. in depth from the heapstead. The sinking was commenced in the year 1830. The first shipment of coal was at Seaham Harbour, Aug. 5, 1833. The foundation of the port of Seaham was laid by the late Marquis of Londonderry, Nov. 28, 1828; the first cargo of coal was shipped in the dock on July 25, 1831. The South Hetton Company have a private line of four miles from South Hetton to Seaham, with a connecting branch from Murton Colliery. The transit of coal over these lines is effected partly by locomotives, by one stationary engine at Heseldean, and by two self-acting inclines, the last of which lands at Seaham. Though the greatest portion of coal is shipped at Seaham Dock, the company have access to Sunderland Docks by rail and to Hartlepool Docks and to all parts of England by rail southward.

The strata sunk through in South Hetton Pit are as follows:—

	fm.	ft.	in.		ft.	in.
Alluvial deposit	8	4	0			
Magnesian limestone	46	5	0			
Marl slate, or fish bed	1	3	0			
Sand with water (900 gallons per minute)	5	0	0	Fms.	ft.	in.
Coal measures to the floor of the Hutton seam	116	3	11½	=178	3	11½

The tubbing of cast-iron, inserted at the time of sinking, is 32 fms. in depth, and has not been renewed. The pressure of water has probably been reduced by pumping at other pits, as that is not great at present. Considerable difficulties were encountered in sinking through the sand, which was of the nature of quicksand. The system of driving piles, which is the usual practice in the district, was adopted in this instance. By using gorse in large quantities for filling in behind the piles, to prevent the sand passing through them into the pit, the large pumping engine being in full operation, the water feeders and quicksand were mastered without more than the ordinary difficulties which attend these undertakings, and at an outlay small in comparison with that incurred at the sister establishment, where three pits were put through the sand. The pit is now divided into three sections, by plank brattice; 4½ ft. of the whole is appropriated for the pumps; the remainder (10½ feet) is divided equally by quarter brattice for two coal pits. The north section is downcast, from which Main coal is raised. The south section is the upcast, where the Hutton seam is raised.

The Main coal winding engine is a lever condensing one, of 45½-in. cylinder, 6-ft. stroke, with two 19-ft. flat wire-rope drums, 24-ft. fly-wheel, foot-break acting on its under circumference; the drums and fly-wheel are supported on a side wall, and an intermediate wood framing. Three plain boilers supply this engine with steam, at 15 lbs. pressure, each 28 ft. by 9 ft. 4 in., wheel-flued; these are covered with 4½-in. brickwork, and the whole of the boilers at the colliery are covered in this manner. About 400 tons of coal is raised per day with two-decked cages, two 9-cwt. tubs in each cage. The south pit winding-engine has a 41-in. cylinder, 6-ft. stroke, two 18-ft. flat-rope drums; it is similar in other respects and in boilers to that described above. It raises about 340 tons of Hutton seam per day with two-decked cages, two 9-cwt. tubs in each cage. The boilers are fed by the respective engines with water at a high temperature from the hot wells; their fittings consist of two safety-valves, and two common floats to each.

On the opening of this colliery, in 1833, coal was raised with these engines by means of corves and flat hemp ropes. Shortly after this large iron tubs were introduced for raising coal, each tub carrying about 1 ton of coal. The coal was brought from the workings in 6-cwt. iron tubs, with tram-wheels, these tubs being placed on rollies, with flanged wheels. The coal was discharged at the bottom of the pit from the small tubs into the large ones. In the year 1836 cages and wooden guides were introduced by Mr. T. Y. Hall, the first application of this mode of raising coal in the district, though it had previously been adopted by Mr. Carr in the neighbourhood of Sheffield, and at some pits in Somersetshire. This important improvement was followed by another in 1842, where rollies were dispensed with, the 6-cwt. tubs being fitted with flanged wheels, thus suiting them for the conveyance of coal direct from the workings to where it was discharged at the screens. About the year 1842 wire-ropes were substituted for hemp-ropes at this and most other collieries in the district.

The pumping-engine was manufactured at Ouseburn Foundry, erected in 1831, and at that time the largest in the district. It is a double-acting condensing-engine, with two large beams, an 83¼-in. cylinder, 8-ft. stroke, working at 15 lbs. steam pressure, and 11 lbs. vacuum. The valves are worked by two air cataracts, from four weigh-bars. Water is raised from the Main coal seam, 140 fathoms in five lifts.

	Fms.		Bucket.	
Lowest lift in the pit	30	....	16 in.	.... From out end of main beam.
Second lift in the pit	50	....	16 in.	.... ditto
Third lift in the pit	30	....	16 in.	.... From in end of main beam, by diagonal rod and V bob.
Fourth lift in the pit	20	....	16 in.	.... ditto
Fifth, in staple	10	....	16 in.	.... From out end of back beam.

The stroke is 6 ft. in each lift. The engine makes three strokes per minute, in day only. At 52 gallons per stroke the delivery will be 156 gallons per minute. Three plain boilers supply steam at 15 lbs. pressure; two are 28 ft. by 9 ft. 4 in., one 28 ft. by 8 ft. The jack-engine, placed at the top of the main engine-house, has one 13-in. horizontal cylinder, 18-in. stroke; wheels in ratio of 1 to 7; one 4-ft. drum. A hauling-engine is placed behind the south winding-engine for hauling in the Hutton seam; it has 30-in. cylinder, 5-ft. stroke; wheels in ratio of 1 to 2, and one 5-ft. drum, worked by lever and vibrating pillar. The wire-rope is enclosed in the pit by boxes of 1-in. deal, 5-in. square, and carried over 6-ft. wheels at the top and bottom. Two plain boilers, 40 ft. by 5 ft., flash-flued, supply this engine with steam at 35 lbs. pressure. The heapstead and framing, shear-legs, main and tail crabs, eight screens for the Main coal, five screens for the Hutton seam, all of wood, are the original plant. An inclined elevator (double) from the Main coal screens, separates the coal it lifts into four different sizes, or into three, as required. The inclined elevator from the Hutton seam screens separates its coal into three sizes. The duff coal thus produced is utilised for coke-making: 32 coke-ovens, 11 ft., dome-shaped, are erected in one double row, with eight chimneys, 20 ft. in height. One chimney is placed centrally between every four ovens, with a branch flue from each to it.

Underground Workings.—Two engines are in operation for underground hauling, the engine for the Main coal with its boilers are placed underground; those for the Hutton seam are on the surface, as already described. Haulage by engine-power is only partially adpoted: a considerable share of the work is done by horse traction, and by self-acting inclines from the rise workings. The Main coal seam is found at the depth of 140 fms. of the following section:—

	Ft.	in.
1.—Sandstone roof.		
2.—Top coal, left as roof	0	9
3.—Coarse coal (falls)	0	5
4.—Shale band (falls)	0	3
5.—Good coal	3	9 Ft. in.
6.—Splint	0	6=5 8
7.—Fire-clay	0	6
8.—Post.		

The bed (No. 5) only is got, the other layers being left in the mine. The average dip of the measures is 2 in. per yard. The Maudlin seam is not found here or identified as one of the workable seams. The Low Main seam is of workable thickness, but yet untried. The Hutton seam has an average thickness of good coal, 4 ft. 6 in.; coarse coal left in mine, 1 ft. 3 in.: total, 5 ft. 9 in. A bore-hole has been put down 145 fms. below the Hutton seam; two seams of coal, supposed to be workable, were proved: the Harvey seam at 203 fathoms, 2 ft. 2 in. in thickness; a seam at 213 fathoms, 3 ft. 3 in. in thickness; and a seam at 240 fathoms, 1 ft. 4 in. in thickness.

The workings of the *Main coal seam* are conducted on the bord and pillar system; pillars are made 40 yards square; bords, 4 yards; walls, 3 yards wide; the bords are driven mostly north and south; the cleavage not being well defined here it is not of much moment whether the bords are driven north and south, or east and west, but the pillars are worked to greatest advantage east or west. The usual method of removing the pillars—with a sandstone roof—is to drive lifts of 10 yards width the whole length of the pillar, 40 yards, east or west, with two roads in each lift supported by a row of chocks on each side. When a lift has been driven 20 yards the back rows of chocks are drawn out, and the roof then usually falls, the front rows stand, the two roads are continued in the same line for the remaining 20 yards of the lift, the coal being brought out by the old front road. About 450 Davy lamps are in daily use in both mines; these are used in every working place. Each lamp is tried by a gas "tester" in every shift. The tester is a vessel resembling a lantern, open at the bottom, and charged with an inflammable mixture; the lamp being introduced into it its safety is shown when it does not communicate flame to its exterior. Powder is used in the whole workings, the firing of shots is performed only by authorised persons. The hauling engine in the Main coal seam is placed 20 yards west of the pit; it has two 14-in. horizontal cylinders, 20 in. stroke, 4 ft. apart from their centres, wheels in ratio of 1 to 3; two 4-ft. drums on one shaft, with clutch between. Steam is supplied from three tubular boilers placed near the engine, two of which are used at once; each boiler has 52 iron tubes, one has copper fire-box; the boilers are fired with coke to obviate the nuisance of smoke. The feed water is brought down the pit in pipes, and is equal to 100 lbs. pressure per inch. The heat and steam from the boilers and engine pass through an arched flue about 30 yards in length to the upcast, or south section of the pit; the steam from the engine escapes through cast-iron pipes the same length. This engine hauls on two roads—one east and one north of the pit; that to the east is about 1000 yards

in length, and dips 2 in. per yard; at its extremity a single-acting horizontal force-pump is worked direct from the axle of the return wheel, with a 6-in. ram, 18-in. stroke at night. At 700 yards in from the pit a branch to the north of 200 yards, and at 900 yards in a branch to the south of 200 yards, are also worked by the engine. Three 6-ft. return wheels are used in this quarter—one placed vertically, one obliquely, and one horizontally, both main and tail ropes are used throughout: 26 tubs are run with each set. The north engine road is nearly level, and 1200 yards in length from the pit to its extremity. At 900 yards from the pit a branch diverges to the west, 300 yards in length; two return wheels are required for the tail ropes in this direction, as the engine pulls both ways; 30 tubs are run with each set. The haulage of coal on the south side of the pit is by horse traction: 3 horses and 33 ponies are employed in this mine for the conveyance of coal.

The stratum of Main coal, near the pit, is affected in a remarkable manner by an irregular intermixture with sandstone, of which the roof is composed; the irregularity is at this place 200 yards in breadth, and passes in a north-east direction near to Murton pits, probably extending to the sea, widening out in its course. In a cross sectional view the coal is altogether absent in some parts, and sandstone takes its place; the sandstone in other parts occurs as a band in the coal; the coal and sandstone again are mixed, as if they had been held in solution together. This deposition gives occasion for much curious speculation, but appearances suggest it to have been subject to tidal influence in an estuary of the sea at the time of formation, as the sides of the wash where the coal first becomes thin consist of a conglomerate of rounded pebbles of ironstone in a matrix of sandstone. These irregular deposits are not frequent in this district; in South Wales, and some other districts they are much oftener met with.

The HUTTON SEAM ENGINE ROAD proceeds in two directions from the pit, north-east and south-east. The north-east road communicates with Murton pits, 2860 yards distant; a large portion of the coal lying between the collieries has been taken to Murton pits, as being to the rise it is conveyed to them with greater facility. The Hutton seam water also flows in this direction from South Hetton. The north-east engine road at present is only 1276 yards in length from South Hetton pit, being in course of working homewards; the dip is about 2 in. per yard. From the extreme point (1276 yards) a north branch proceeds 110 yards; at some distance higher up is a similar north branch; the empty tubs run inwards by their gravity, 24 tubs are run with each set. The south-east engine road is 1400 yards in length, without branches, 32 tubs are run with each set; these run inwards by gravity, excepting at the top, where the assistance of a horse is required. The workings on the west side of the pit are extended a distance of 2½ miles. Coal is conveyed to the pit by means of two self-acting inclines, and by horse traction on the level parts. The first incline is 1040 yards, the second is 600 yards in length; 14 tubs are run with each set; 12 horses and 24 putting ponies are employed in this seam. The Hutton seam pillars are made 40 yards square; they are taken away in 5 to 7 yards lifts, east or west, after a north lift has been taken up to shorten them, leaving about 34 yards for the length of the lifts. The remarks on the Main coal seam in reference to cleavage, the direction of bords, the use of powder and safety-lamps are applicable to the Hutton seam as well. An explosion which happened at this colliery, April 24, 1843, caused the loss of two lives; it is the only one recorded. There has been a remarkable freedom from all other classes of accidents.

The ventilating furnace—10½ by 6 ft. in length—is placed in the Hutton seam near the bottom of a staple, through which the heat and smoke ascend to the Main coal seam, and from this by a three-flued passage of 60 yards eastward to the upcast section of the pit. The ventilation is accelerated slightly by the heat and steam from the boilers and engine in the Main coal seam. A part of the ventilation is derived from the Murton upcast. The circulation of air in the Main coal and Hutton seam workings is 46,000 cubic feet per minute; fresh air to boilers, 4000 cubic feet per minute; ditto to stables, 5000 cubic feet per minute=55,000 cubic feet per minute. Of this total 23,000 cubic feet is created by the Murton upcast, and 32,000 cubic feet by the South Hetton upcast, with 3-10-inch water-gauge. The principal offices and workshops for the two collieries are at South Hetton. The shops comprise smiths', containing 10 fires, blown with fan blast; fitting-shop, containing four machines, and saw-mill outside; the fan, machines, and saw are driven by a beam-engine with an 18-in. cylinder, 4 ft. stroke, from shafting and belts, with two boilers 30 by 5 ft. There are also joiners' and sadlers' shops, and storehouse. Adjacent to these is a locomotive shed. Six locomotives are used for the transit of coal from South Hutton, Murton, and two adjoining collieries, over the level portion of the private lines. An engine at the Granary has an 8-inch horizontal cylinder, 16-in. stroke. The whole of the hay and corn used by the horses and ponies is prepared by machinery; the hay is chopped, and the oats, with beans, &c., are crushed for this purpose. Gasworks are erected at this colliery; the bottom of the pit is lighted by gas in each seam, taken from the surface.

MINES REGULATION BILL, 1871.

SIR,—This Bill will soon be in committee. I forward some observations on its various clauses, being desirous to call the attention of our practical mine agents and our landowners to the provisions of the Act, and they must bear in mind that if any alterations or amendments are desirable now is the time to press them.

April 17. A CORNISHMAN.

MINES REGULATION BILL, 1871.

OBSERVATIONS ON THE VARIOUS SECTIONS AND PROVISIONS OF THE BILL.

CLAUSE 3.—*Definition of the term "Owner."*—Means immediate proprietor, or lessee, or occupier of any mine or any part thereof, but does not include a person who merely receives a royalty from a mine.

"Agent" means any person having, on behalf of the owner, care or direction of any mine, or of any part thereof.

The meaning of "agent," therefore, depends, to a great extent, on the meaning of "owner."

The weight and responsibility of the Act rest mainly on the shoulders of "owner" or "agent," who are to be guilty of offences, and liable to fine and imprisonment under the Act.

The term "owner" is used between sixty and seventy times in the Act; the importance of a proper definition is, therefore, self-evident.

It is to include the "immediate proprietor." In the case of a very large extent of land the owner of the mines is not the owner of the surface, and the mines are worked under grants from the mineral owner alone. Who is the "immediate proprietor" in this case? The grantor in such a case is "a person who merely receives a royalty." If so, who is the "owner?" Who is to be liable for the penalties under the Act and bound to fulfil its obligations?

2d.—"Lessee."—In many parts of the country, and specially in Devon and Cornwall, mines are not worked under "leases" at all, but under mere licenses to work for, search, take, and carry away the minerals, &c.; with no term, estate, or interest in the surface. Also in Wales under "tack-notes." The grantees under such setts very often are bare trustees for the company, and frequently cease to have any interest in the mine. How would the definition of "owner" affect them? They might be liable to very serious penalties for matters with which they had had nothing to do, and over which they could have no control.

3d.—"Occupier."—Does the term "occupier" include a shareholder? Many of the metalliferous mines are worked by large companies, either limited liability companies, or in cost-book mines by cost-book companies with tranferable shares. If "occupier" includes a shareholder it would be a very serious matter, and very likely to interfere with the important mineral industry of the counties of Devon and Cornwall, as persons would hesitate to take shares in a mining company by which they would be exposed to liabilities and penalties for matters which they be unable to control, and for "not doing or causing to be done" things as to which it might be impossible for them to know that they were necessary to be done. See, for instance, Clause 35, as to accidents. The owner is to send notice to the Secretary of State within twenty-four hours, or he is to be guilty of an offence against the Act. How is it possible for a shareholder to do this, or for a lessee or grantee, or for the actual owner of this mine (say, for instance, Lord Falmouth) to do it? He might be hundreds of miles away, or, if even a short distance only, might never hear of the accident for days; and yet he is, under the clause as it stands, guilty of an offence against the Act. It is clear that a proper definition of "owner" lies at the root of the Act, and it would seem not to have been considered with reference to the actual circumstances under which mines are worked and carried on.

The interpretation Clause 3 will need the most careful consideration.

"Court of Summary Jurisdiction."—This creates a very serious difficulty for the mines, as any two Justices of the Peace in Petty Sessions would have power under the Act to enforce penalties, and to commit a person for three months with hard labour. Even though the decision is appealed from, the justices might at discretion still enforce the commitment (See Clause 45, Sub-section 47).

CLAUSE 8, SUB-SECTION 3.—The usual period of employment for our miners in Cornwall underground is eight hours. The boys accompany their parents or other skilled miners to learn their business, and assist in tramming the stuff, wheeling the barrows underground, or in holding the bores, &c. The men work eight hours only, and then come up to surface. The boys under 16 are by this clause to do nothing for one hour out of the eight. Are they to remain idle underground; and, if so, of what benefit could it be to them? It might seriously interfere with the men's work. It is suggested that in metalliferous mines the period of employment should be made eight hours, and not five.

CLAUSE 8, SUB-SECTION 1.—The term "Bank" is used. This term is not known in mines within the Stannaries. It is a term, it is believed, chiefly used in coal mines. We use the term "surface" or "grass."

CLAUSE 9.—*As to Education.*—This has been so fully discussed that it is unnecessary to refer more to it. But, why are evening schools excluded? In the winter, more especially, education at an evening school is a very good substitute for idleness at home, or in the streets or lanes of the town or village.

How can the owner or agent cause such boys to attend school? They could not compel it, and the only course in such cases will be to discharge the boy from employment at the mine—a serious injury to his parents. In the Cornish mines the children of widows and disabled fathers have the preference in employment when their parents formerly belonged to the mine, and their earnings help to keep the family from the parish. Anything preventing such employment would be a serious injury to the poor miners. It is understood that this clause is to be limited to boys working underground. This would certainly, to some extent, reduce the injury which would otherwise accrue to the poor miners.

CLAUSE 11.—*Workshops Regulation Act.* 1867.—This is wholly inappropriate to our mines in Cornwall and Devon. It is understood Mr. Bruce is willing to limit this clause to coal mines.

CLAUSE 21, SUB-SECTION 16.—*Drying Houses.*—This says the dry shall be "near the entrance of every mine." What does that mean in case of our mines? There are several shafts in many mines, and the dry is so placed as to be most convenient for the men using the various shafts. The wording of this needs alteration. As it at present stands it does not meet the case of our mines.

CLAUSE 22, LINES 14 TO 20.—This is a very extraordinary clause as it stands. In the event of any contravention of the regulations *by any person whomsoever* the owner or agent is to be guilty of an offence against the Act unless he proves his innocence. This is contrary to first principles. If a miner uses an iron tamping-rod or an iron pricker, the owner is to be guilty of an offence. It is well known that there is great difficulty in guarding miners against their own negligence. The owner or agent *cannot see* what they are doing underground, and yet are to be guilty of an offence unless they prove their innocence.

Opening and Abandonment of Mines.—CLAUSE 34.—Who is to be liable under this clause? Mines may have been abandoned 50 years ago. Who is to fence them and keep them fenced? Here the importance of defining the term "owner" is immediately apparent. The shafts are not only to be fenced, but *are to be kept securely fenced*; does that mean to be so kept for all time, or for what time? Are the companies working the mines and afterwards abandoning them to remain always liable to keep the shafts securely fenced? Surely, this cannot be intended. The obligations under this clause as it stands would entail serious liabilities and difficulties on lords and adventurers.

If the owner of the surface but not of the minerals is to keep the shaft securely fenced at all times, when and from whom is he to look for indemnity for the continuing expense? Under the definition of owner in Clause 3, it would seem that he would not be entitled to claim indemnity from the owner of the minerals under whose grant and for whose benefit the shafts had been originally opened and kept open.

CLAUSE 35.—*Notice of Accidents.*—This clause is very curiously worded. What is the meaning of "any serious personal injury?" Who is to determine what is *serious*, and what is not? How is the owner to determine, and how is he to send notice to the Secretary of State within 24 hours? How is he to *specify in such notice the probable cause of the accident?* This clause puts the owner or agent under penalties, and makes them guilty of an offence against the Act, &c. Many noble peers and large landowners, if the clause passed in its present shape, would find they are guilty of offences of which they never dreamed. This clause and several others seem to show that they have been prepared without practical knowledge of the circumstances under which metalliferous mines are prosecuted.

The Provisions as to Plans of Mines—CLAUSES 41 AND 42.—The importance of mining records has long been recognised, and a Mining Record Office has been established at the Museum of Economic Geology, under Prof. Robert Hunt. If plans of mines could be collected there, and made available for public advantage, it would no doubt be very desirable, but by this Bill they are to be sent to the Secretary of State to be kept by him, and no one is to see them for 20 years without consent of the owner.

Here also the question arises, who is the owner of an abandoned mine, and as such liable to supply the plans? These plans may be expensive, and the obligation to supply them a costly one. Does it include old workings by previous adventurers? Such, for instance, as at Ding Dong, Wheal Vor, or other old mines, portions of which have been long since abandoned? This clause needs careful consideration and amendment if it is to be operative or of any public use.

CLAUSE 43, LINES 4 AND 5.—In January in every year the owner or agent is to make a return to the Secretary of State of, among-st other things, "the average quantity of material wrought in such mines." What is the meaning of this? Does it mean the average quantity of ore raised, or deads or attle brought to surface? What is the meaning of average quantity? Does it mean the average per month, or what and how is the quantity or *average* quantity to be ascertained? Are our miners to keep an account of every kibble full of attle brought to surface, and its weight? What can be the possible object or advantage of such a return? It says, also, "of material wrought." Does it mean materials used, or what?

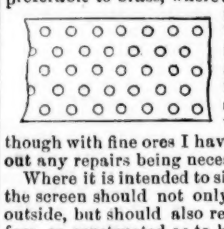
The Bill evidently requires minute and careful consideration, or, if it becomes an Act, we may find ourselves, owners, agents, and miners, in unexpected difficulties, and under serious and indefinite liabilities.

ORE-DRESSING—No. IV.

SIR,—Before turning our attention to the further operations which the crushed ores have to undergo, there is another point of some importance in connection with the crushers which we ought to examine. This is, the manner of application of the motive power to the stamps or crushers. It is perfectly self-evident that of all the different machines used for ore-dressing none require so much power to drive them as the crushers, and certainly none impose such heavy and irregular shocks and strains on the engine, or whatever motive power is employed. This is, of course, unavoidable, and it is, therefore, always advisable, if practicable, to have a special engine for this purpose, which will have no other regular duty to perform. Nearly all other dressing machinery requires the utmost regularity of motion in order to obtain a good result, and this regularity is almost unattainable if the crusher is connected with the same engine, unless, indeed, the latter be of a size and power much superior to the work it is required for. If the engine be provided with an extra large and heavy fly-wheel the effect of the shocks will be somewhat moderated, especially if the crusher be not driven by tooth-gearing from the main shaft, but even then the difference of speed consequent on these strains is easily perceptible on the more delicate concentrators. Where it is really unavoidable that the same engine should drive the crushers and also the other machines, I have always found it advisable to separate the crushers entirely from the engine, and run them with belting, at the same time giving to each set of rolls a separate heavy fly-wheel. In this manner a pretty regular motion can be obtained for the rest of the machinery, and it also permits of an extremely simple and light construction of the crusher. This system of separating the rolls or crushers from the engine, and thereby saving all the heavy and expensive tooth-gearing formerly in use, is now coming very much into use in Belgium and Germany, and has many advantages over the old system.

SIZING, OR CLASSIFICATION.—We have now come to the third operation in ore dressing—that of classing the grains obtained from the crushers according to their sizes. This is a most important operation, and also one that requires much judgment and attention. Indeed this operation is, as I have before stated, the key to all further concentration, for without it the very principle on which all concentration both by air and water is based ceases to exist. It is evident that there is no use in trying to separate a heap of minerals according to their respective specific gravities unless the pieces are of a more or less equal size. The nearer a perfect uniformity of size is obtained, the more complete and easy will the after separation be. This fact is so true, that in many of the large and complete dressing-floors of Germany it is now customary to size the ores through screens whose meshes would vary only from 0·0015 to 0·002 metres in diameter of holes (equal to about from 6-100 to 8-100 of an inch). This is, of course, carrying things rather to an extreme, but still in many places where the ores are found finely intermixed together, either with the gangue or with other minerals, it pays well to do it. Such a complete sizing would only be carried out where a very large number of concentrators are at work, as each size requires either a machine for itself, or at least it must be treated separately from the others, for although no machine can concentrate ores of different sizes at one time, still a great variety of sizes may be treated separately by the same machine. There are two systems of sizing ores—with flat screens and with revolving cylindrical screens. The first system, which is now very little used, generally consists of a series of rectangular screens, 3 ft. 6 in. long, and 2 ft. wide, placed one above another in step fashion—that is to say, in such a manner that the stuff which is too large to pass through the upper screen falls over on to the next, and so on. These screens are suspended by chains, at an inclination varying according to the size of the stuff to be passed through. A shaking motion is imparted to them, generally by a cam arrangement. The chief objections to these screens are—first, in order to make them really efficient, the ore should be kept dry, as the fine parts would in case of moisture be very apt to ball and roll off the screen instead of passing through. The second objection is in the great amount of wear and tear in the whole apparatus, and also the loss by fine dust, which is unavoidable where a dry screening is necessary.

The revolving screens, which are those now mostly in use, are of an extremely simple construction, and give the very best results. They generally consist of a hollow truncated cone, in which the envelope consists of the screening material, either perforated plates or wire-cloth. The ore is fed in at the smaller end, and works its way down towards the larger opening. This conicity of the sides simply serves to give enough inclination for the larger grains to fall towards the big opening, thus avoiding the necessity of placing the shaft, on which the whole revolves, at an angle. These drums may vary a great deal in size, according to the duties they have to perform. Those most generally in use average from about 7 to 9 ft. in length, with a medium diameter of 3 feet. The envelope may be divided into two or more partitions, having meshes of various sizes, so that the ore which would not pass through the first compartment travels onward to the second, where the mesh being larger, another portion is separated, and so on. The length of these compartments, if we may so call them, must be made to vary according to the proportion of coarse and fine ore to be screened. As a general rule it is best to make the finer meshes about half as long again as the coarse ones—first, because the amount of fine is generally very large in any mass of stuff; and, second, because it takes much longer for each grain to find an outlet when the quantity is large. A great deal has been said and written about the merits and demerits of perforated sheets of metal, as compared to wire-cloth as a straining medium. One of the chief aims of the operator is, of course, to obtain the greatest amount of straining surface in the least possible space, and in this respect wire-cloth certainly carries off the palm. In my estimation, however, the use of the latter material presents other defects, which more than counterbalance the above-named advantages. These defects are, first, the fact that in wire-cloth the holes of the mesh are rectangular, and, therefore, in reality permit of two sizes passing through at once—those grains which are not larger than the sides of the rectangle, and those which pass through on the line of the diagonals. This difference, though scarcely perceptible to the eye, causes a very marked difference in the after concentration. The second objection to wire-cloth is the fact of its wearing out with great rapidity, especially when hard blendes or quartz stuff are being screened, for, of course, the moment one thread is cut it slacks out through the whole texture. I have generally found that perforated plates, either of strong brass or iron, though costing nearly double the amount at the outset that wire-cloth would, are still preferable, and cheaper also in the long run. For all sizes, down to 1-16th of an inch diameter, iron is much preferable to brass, wherever it can be obtained, as it is, of course, much cheaper, and will last quite as long. The greatest amount of straining surface is obtained when the holes are arranged alternately, as per sketch, rather than when they are placed in straight rows. Good sheet-iron will last in constant wear, and with coarse ores, about nine to ten months, though with fine ores I have had some last as long as two years without any repairs being necessary.



Where it is intended to size very fine stuff it is quite necessary that the screen should not only be well washed by jets of water on the outside, but should also revolve in water; and it should be, therefore, so constructed as to be able to retain about a depth of 2 in. to 3 in. of water inside the screen. This is generally done by having the screen to revolve in a trough, so constructed that the water may be kept at a given level. Were this not done, the fine ore and mud would at once ball together, and thus prevent any regular classification. In using all cylindrical screens there are two points to be well attended to—first, the feed should be maintained as regular as is possible, and the stuff should be thoroughly disintegrated in water before entering the screen. If this point be not well attended to the particles are apt to clog up and ball together, and in that shape either roll out at the lower end of the screen or else break up again after they have passed the division where they ought to have dropped through, and thus only a very imperfect sizing is obtained. The second point to be well attended to is the speed at which the screens are to be driven. The speed must vary much, according to the size of stuff to be worked. As a general rule, we may take it that the speed should increase in a direct ratio with the increased size of the ore. For grains of (say) ½ in. down to ⅛ in. diameter a speed of 20 to 25 revolutions per minute may not be too great, whereas fine sand would be better sized at a speed not exceeding 12 revolutions. Where screens are well and conveniently placed, and are made self-feeding, the cost of classifying, or sizing, becomes very slight indeed. In Germany and Belgium we generally count that the cost is not over from 6d. to 8d. per ton. In England the average cost would be from 14d. to 16d. per ton, including the wear and tear of machinery. In America very little attention has been given to this stage of ore-dressing up to the present time, and it would be difficult to estimate what the actual cost per ton might be.

New York, March 11. E. G. SPILSBURY, Civil and Mining Engineer.

MINING INDUSTRY—SPIRITED, AND ENCOURAGING.

SIR,—Mr. Barnard, in last week's *Mining Journal*, reminds me of an address I gave about four years since on the occasion of laying the foundation stone of some new works for the Cornubia Chemical Company: that address will show that Mr. Barnard is not alone in his efforts to promote the mining interest, and probably encourage the many others whose efforts tend in the same direction, who have not met with a Mr. Barnard to assist and bring them before the public as Mr. Doble has. Were it so the country would much sooner receive the benefit of many valuable inventions; as inventors are seldom rich, indeed mostly operatives, who in the majority of instances are greatly discouraged in consequence of the treatment they receive from men of capital.

For many years past my energies have been devoted to improvements in the various departments of mining, and only in one instance did I receive any encouragement until long after their utility was established, and in that instance I failed to accomplish the purpose intended, for we are not always right. If the mining public took a little more interest in these matters, and afforded assistance to inventors, as Mr. Barnard has, the gain to themselves and the public would be immense, even if therein were occasionally failures; but it is satisfactory to me that in seven cases out of ten I have succeeded, some on which one company has made a profit of 25,000*l.* per annum, and many more are working with great success.

I came upon some papers yesterday that I communicated to the Wheal Martha adventurers (now New Great Consols) ten years since. It was an improved process for treating their ores, and a very small sum would have satisfactorily tested the plan; yet had they tried it they would have detected the tin, and at the same time would have realised large profits—a blessing to the shareholders, and a credit to mining in general.

But this is a digression from the subject of my address, which was founded on three mottos, which I give in English, and will in themselves show the direction of my efforts. "All is taken" was the motto selected for one company, six years since; and my object years before then, and ever since, has been to establish a works that shall by one continuous process, and at a mere nominal cost, extract from mineral stone sulphur, arsenic, silver, copper, zinc, gold, and tin, should the stone combine the whole of these products, which a large proportion of the ore in this district does, excepting gold, and also the profitable conversion of the residuum. This a long practice teaches me I can do, and when the public are ripe for it I shall be ready to prove it successfully. A considerable portion of it I hope to establish at the celebrated St. Vincent Mines, near this place, in a few months—arrangements having been made for the erection of the works immediately, there being already laid open in and on the mines more than 20,000 tons of stuff, containing from 20 to 4000 ozs. of silver to the ton, and a high percentage for copper and blende, which I can extract at less than 1*l.* per ton, and find profitable employment for the residuum.

I trust Mr. Doble's process is all Mr. Barnard claims for it. I have no reason to doubt it, but though residing very near his model works I have never attempted to discover their secret. I should deem it dishonourable to do so: a genuine inventor will not do it; he has too much confidence in his own abilities. But I will bear Mr. Barnard out in the fact that the silver lodes of this district, independent of the rich bunches which are so frequently met with, contain silver throughout, which when treated by the present im-

proved methods will leave splendid profits. The highest authority in the district (Capt. Knott, of the Queen Mine) has said that the poorest portions of the lodes will pay the entire cost of the mine and extracting, leaving the rich bunches all profit, and these are reported to have exceeded in value one million sterling from the St. Vincent Mines in less than three years. Already the new company have raised silver ores worth 4s. per ounce as raised. This certainly indicates something of the former prosperity for them; but from the St. Vincent to the King there is not such another silver-producing district in England, or out of it, and if parties wish to participate in the success they should do so now; for be assured my second, which is my own, motto will not long hence produce results from this district which we cannot realise at present—"Labour overcomes all things." Cornishmen must and are now following in the footsteps of the Germans, and the day is not far distant when these alone will keep our mines afloat; the principal ore being all profit: and I think I may take some credit for raising them 150 per cent. in value during the last few years, and I question whether some little credit is not due to me indirectly for the starting of the Queen Mine. But to the full realisation of these things my third motto, the grand old motto of the county, must be brought into full play. "One and All" must co-operate, in achieving success.

You have afforded me many an opportunity of directing the attention of the mining public into new channels for success, and it has been with much satisfaction to those who have taken my advice; and I trust that "One and All" will unite to make the silver mining of our county one of the greatest achievements of the age.

Harrowbarrow, April 20. C. PENGILLY.

MINING IN COLORADO.

SIR,—Since I last addressed you concerning the mines of Colorado this territory has made great progress in developing the mineral wealth that abounds within it. At the latter end of last year I paid a short visit to the silver and gold regions of Georgetown, Idaho, and Central City, and saw enough to convince me, even from the comparatively small development that has yet been made on the thousands of lodes which has been opened upon, that as soon as the country obtains railroads, and procures cheaper labour and smelting-works, the amount of bullion that will be turned out is incalculable. The principal want is smelting-works; the owners, thoroughly convinced of the undoubted value of their properties, will not sell them except at big figures, nor do they work them, from the impossibility of utilising in any way at the present time the base metals contained in the ores. The moment smelting-works are erected, and a remunerative price offered for their ores, hundreds of mines will spring into active work; but while it is impracticable to mine at a profit ores containing from 50 to 100 ozs. of silver to the ton, the Territory will not be developed to any extent, as such mines as the Terrible, with ores containing from 400 to 500 ozs. of silver to the ton, are few and far between. In my opinion no surer, better, and safer investment of capital can be found than in the erection of smelting and reduction works in the Far West, if they are erected at eligible spots, conducted with competent skill, and sufficient amount of capital. Appended I send you the latest mining items from Colorado.

Bartholomew House, April 26. WILLIAM COPE.

GEORGETOWN, *March* 30.—The following items from the lodes being worked around here will prove to you that as each one is developed the abundance and value of our mineral riches is undoubted. You, of course, remember in quoting the following items *no value* is given for the base metals, and only 80 per cent. of the contents of the ore is returned to us by the process at present in use here—an expense of from $35 to $50 per American ton of 2000 lbs. Some ore from the SWEEPSTAKES LODE, Leavenworth Mountain, treated at Stewart's Works, yielded by mill treatment 181 ozs. of silver per ton. The KILWINNY LODE, on Republican Mountain, is yielding some rich mineral; a small lot has been sold to Stewart last week at the rate of $372 per ton. Ore from the COMSTOCK LODE, situated near Alvarado, is being treated at Stewart's Works, and yields silver at the rate of $380 per ton, the base metal, of course, being wasted. The SENECA LODE, on Leavenworth Mountain, is now in ore; a small lot has been sold at the rate of $587 per ton. The INDIGO LODE, Leavenmouth Mountain, is still producing good ore; a lot of mineral from this vein was sold to Stewart at the rate of $1246 per ton. The INGRAHAM SLIDE, on Leavenworth Mountain, continues to slide funds into the pockets of its owners; a lot of ore has just been sold from this lode at the rate of $560 per ton. The WHITE LODE, on Republican Mountain, is looking well; the mine shows in every part of the workings a pay vein of from 4 to 12 in. of good ore—sulphurets, with a small amount of galena. The ore from the White runs well; the first-class yielding by mill treatment 260 ozs. of silver per ton, and the second-class averaging 90 ozs. per ton. The Burleigh Tunnel, after being run 935 ft., has at length cut a fine lode at a depth of 700 ft. from the surface; it is 15 ft. in breadth, with fine defined walls. The breadth of the mineral in the whole vein is about 4 ft. The highest assay as yet obtained is 72 ozs. of silver and 60 per cent. of lead to the ton. There is great excitement here at the success of this tunnel, as it proves our lodes in depth, and shows the necessity of smelting-works.

IMPERIAL OTTOMAN MINING COMPANY.

SIR,—Some vague correspondence about this mine was published in the Supplement to the Journal of April 15. Three separate letters, all written much in the same strain, as if prompted by one "master mind," simultaneously appeared; and as it is somewhat unusual for *bona fide* shareholders to write in a sense that can but be damaging to their own property and interests, I venture to question whether your correspondents, "Miner," "A Large Shareholder, and "A Shareholder," are sincerely interested in the welfare of this mine.

Myself, I happen to be a holder of shares to a considerable amount, both as an original shareholder, and as having continuously increased my holding. I have made it my business from time to time to apply at the office of the company for information about the progress of our venture; and although your correspondents write to you about the secresy and mystery of the conduct of our directors, and the difficulty they have met with in obtaining information, I state here, without the possibility of contradiction, that my enquiries, however searchingly they may have been made, have been ever met and satisfied in the most open and candid manner. I take this opportunity of thanking the secretary of the company for his uniform courtesy in receiving me and replying to my questions.

I think, Sir—and when I say I think I mean to say I am confident—that if your correspondents had taken the same trouble that I did—to have gone to the fountain head for their information, they would have learnt that our prospects, in place of suggesting condemnatory letters, are really the subject of much hope to the *bona fide* shareholder. But, Sir, my primary object in trespassing on your valued columns is not so much to refute the fallacies of your correspondents, as it is my desire to re-assure my co-partners, and remove impressions that may have unfortunately been created by the unwise correspondence in the Journal.

Probably there is little or no occasion to appeal to the common sense of the adepts of my co-partners; but in the general proprietary of mining or other joint-stock ventures, what is the proportion of the adepts as against the tyroes? Individually, I do not wish to see my own property disparaged in value, even temporarily, and on public grounds, moreover, I wish to convey to others what I know of matters that interest us collectively.

Such are the reasons, Sir, that influence me in answering the letters of Messrs. "Miner," "A Large Shareholder," and "A Shareholder." To the first, I say that "practical miners" do not expect much information about, and certainly no returns from, a mine before its machinery, plant, and gear are set up and put in working order. I say further to him that it is not quite reasonable to write about "rigging shares" when the matter of buying or selling the smallest quantity is so tedious an operation that it is *quasi* impossible. To the second, I say that reports can only be published about a mine when there is something to report about—a position not exactly established before the machinery, &c., are in full working order. To the third, I say that he writes exactly so like the first and second, word for word, that in answering them I answer him. To the three collectively—although I half suspect there is a lot of unity in the trinity—I say, and I direct this observation to all persons sincerely concerned in the future of this mine, that it is a rare occurrence in the history—nay, in the most favoured traditions—of mining venture that such satisfactory accounts can be had of a young concern as are to be obtained at the offices of our company by those who pursue their enquiries in a *bona fide* way, and without *arriere pensée*.

To those persons I say more—I say go and make your own enquiries for yourselves; do not be influenced by what you have been told in an *exparte* way, by what you have read, or by what you are reading. If you are not satisfied with what you learn, I shall have written a long letter in vain, and shall have stultified myself by my statements. Further, I happen to know that, from causes entirely pecuniary and temporary, some shares will be submitted to public auction during the next week at the Open Stock Exchange. I can promise that they shall not be sacrificed for want of a buyer.

London, April 20. EMGEEN.

IMPERIAL OTTOMAN MINING COMPANY.

SIR,—You were kind enough to insert my last letter, and my attention has been drawn to three letters which have since appeared in your excellent Journal respecting the present state of the Ottoman Mine, and I was in hopes I should have seen some reply to them in last week's Journal; as I have not done so I trust you will allow me to direct the notice of the directors and shareholders to this subject through your columns. The Ottoman Mine has been in existence now 21 months, and in the prospectus issued by the directors there were no less than four reports from the following gentlemen:—Capts. Richards, Pope, Vivian, and Mr. Fishbach, all of which state there is sufficient ore *in sight* (at the Imperial Ottoman) to give good profits at once. Now, if these reports were true there must be something wrong or mismanaged by Capt. Chapman, the present manager of the mine, as in Midsummer, 1870, he reports he has several tons of ore at the surface, while I have been lately informed that there is only now a small quantity of lead ore for sale. Surely this requires no comment from me, as it speaks for itself. Indeed, what can be said to all this?—either the reports of these well-known captains are ilusive, or else there must be some motive for the non-developing of the mine. I am also informed—I do not know how far this may be true, but I give it as I heard it—that some of the directors and others concerned have a very large interest in the company: this, if true, would speak much for their opinion of its value (as they are behind the scenes), and it is well, therefore that the small shareholders should know this at all events.

I think the body of proprietors of the Imperial Ottoman Mine will agree with me that it is high time there was a general meeting, for the affairs of the company to be discussed, and for the directors to give an account of their stewardship. I write for all the shareholders, being no party man; but I must agree with those who have written before me that all reports should be inserted regularly in the *Mining Journal*, and why there has not been a settlement before now surprises me. I trust you will kindly allow this to appear in your next Journal.—*London, April 25.* MINER.

"SCIENCE AND THE EMPIRIC ART INSEPARABLE IN MINING."

SIR,—We are all anxious to glean original information, which is so conspicuous a feature of the letters communicated to the *Mining Journal*. You open your columns to all shades of opinion, and nothing can be more desirable than to collect suggestions and judgments out of which we may ultimately eliminate the truth. It is with regret that, in the Supplement to last week's Journal, I came across such a letter as Mr. Robert Knapp's, under the strange title which is superadded to this communication. I do not wish to enter into any critical examination of that letter, but I cannot refrain from observing that whatever of value it may contain is entirely lost, in consequence of the language being so involved and mysterious. Indeed, it is impossible to feel sure what may be its meaning. So far as I can comprehend it, the object is to show that mining can only be successfully carried on by those have a genius for it, which no experience or book learning can give to him. The author alternately despises and extols science, and does not admit that any practical results can come of scientific training. It is too late in the day to maintain such opinions. The inter-dependance of art and science in aiding the progress of civilisation is too widely recognised to admit of such a view.

However, the principal object of this letter is not to criticise what Mr. Knapp may think, for I am not able to gather it from his letter. My object is to express my regret that people who have anything of value to communicate should ever adopt any other than a simple, clear, and unpretending style of writing. The whole of Mr. Knapp's letter is an example to the contrary. How simple and intelligible is this passage—"An error to which mankind are very liable when light dawns upon a truth is to begin its elucidation at the wrong end." But instead of keeping to this simple style he adopts the following:—

"Sometimes by attempting to separate essential parts of the same thing, and to set in independent motion things which can only obey reciprocating influences. A similar error has been committed by attempting to eleminate harmonious responces by an arbitrary union, or union by forces of hetrogenous elements having an affinity for each other, and the tendency of whose natural aptitude is to gravitate transversely or diversely to each other, and hence can never act in the same plane, and escape collision."

There may be a clear and intelligent idea beneath this mass of words, but as they stand they are simple nonsense. The Editor of the *Mining Journal* is very generous in admitting letters expressing any shade of opinion; the readers, however, have a right to ask that the communications should be made by the writers in language that can be understood. I have endeavoured to avoid being too severe upon Mr. Robert Knapp. I am not aware that other readers have found the same difficulty tn comprehending his letter as myself. I shall be glad of a simple translation of its meaning, if anyone has been able to come at it. CRITIC.

THE INACCESSIBLE AND ACCESSIBLE OF THE MINERAL KINGDOM.

SIR,—In my letter last week I intimated my intention of entering into detail *apropos* of my late visit of inspection to Cornwall. Severe pressure of business prevents me from performing this week what I was so desirous to accomplish. I shall next week be able to supply your columns with details of Cornish mining indubitably interesting. Meanwhile permit me to send to you some lucubrations, which may appear interesting to some of your readers. There are various parts of the world which are presumed to be rich in mineral treasure which are inaccessible to man, except to the explorer. Men of happy audacity, and of geological and mineralogical resources, have searched out some of the abodes of the gnomes, and pronounce from various causes the treasures contained there to be beyond the reach of the practical miner. High up in the Himalayas, and on the declivities towards Thibet, there are valuable deposits of ores for the present beyond our capacity to work out, and convey to the markets of India. In North-Western China there are several metals, notably gold and copper, and precious stones in quantities scarcely credible to relate; but the Chinese, like the dog in the manger, which has so often served as an illustration, neither eating the hay nor letting any creature approach it that would, so the jealously of the Chinese opposes all ingress of foreigners in that direction, and cannot brook that even the people of the country should be benefitted if the foreigners should profit also. There is a precisely similar state of things in Burmah. Not far from British Burmah, on the Pegu route, gems abound, as in North-Western China the natives sometimes pick them up and rudely polish them, but there is no scientific search for them, and foreigners dare not seek them. As wherever there is gold, gems, especially the diamond, ruby, and carbuncle, are sooner or later of certain discovery, so the converse of this may fairly be inferred where these gems are the gold is hidden at hand.

In the western hemisphere there are deposits of metallic wealth in places where, from the lightness of the atmosphere and practical inaccessibility, men cannot work for them; this is the case on the summits of the Andes and the Cordilleras. Similar statements have been made in reference to the continuance northward of these chains in the Rocky Mountains. But although there may be places whence the carriage of ores would be difficult, and their extract laborious, we cannot believe that within the bounds of the United States treasures even in such places will long escape the eye or hand of man. An age may come when new convulsions from beneath may throw up to the feet of man new and exhaustless mineral treasures, for God maketh nothing in vain, and all things on this planet for the fruition of man, even the secrets of its bosom, are made known to us, when we see even its deepest stratum—the granite—thrown up through the series of strata to high elevations above the surface.

It is one of the phenomena of the age that, however vast the inaccessible mineral kingdom may be, that which is accessible is enlarging almost from day to day, and widely as man is working in the mines he has not sunk upon probably one-half of those known to exist. It is remarkable, too, that the more metals are sought the more they are bought. The use grows with the provision for it, augmenting continually the activity of the trade in metals. At home, in our own islands, we have illustrations of this. In South Wales, it is well known that Cardiganshire is not one-tenth worked for its silver-lead, and Merioneth, Flint, and Monmouth still less searched.

In Cornwall, although about 150 mines are at work which had stopped during and subsequent to the financial and commercial panic of 1866, still as the spirit of enterprise is awakened investors have the opportunity of adventure in new fields, for a very large area of mineral ground remains unworked in South-Western England. The little island of Mona, where the Great Laxey has effected such wonders, has been very well explored, and it is the prevailing belief that more silver-lead can be got out of it than it now produces.

Ireland, also rich in anthracite, iron, lead, silver, and copper, and some think in gold, is comparatively a *terra incognita* to the mining world; but the late Matthew Francis, and more recently Mr. Geo. Henwood, bore a testimony highly in favour of its mining capabilities. If we look abroad, Spain, and Italy, and Russia are in Europe the most likely to add to our fields of metallic labour.

In North Africa the explorations of the late Matthew Francis assures us that metals are to be found, especially iron. In Southern Africa the journey to the newly-discovered gold fields by the rival routes of the Cape and Natal is being made easier; bullock tracts are being turned into roads, the lumbering wagon drawn by oxen, for the lighter one drawn by heavy draft horses, it is true, best affording a great accession of speed compared with the old covered wagon of the Boer. The controversy as to the eligibility of the routes may now for Europeans proceeding to the diggings be considered settled. Natal is nearer as to distance, and the boundary of the colony approaches nearer than that of the Cape Colony does to the gold and diamond regions; where, although not as yet discovered, rubies and carbunicles, and probably other precious stones, will soon glitter in the clear light of Southern Africa. One diamond has been found by a woman, since purchased by the Governor for 600*l*. Now that the British have sent agents to the territory, and as Moselekatse, the chief of the vicinage is favourable to the British, our fellow-citizens at the diggings will not live in a lawless community, and the treasures there will be all the more accessible.

In India there are symptoms that the celebrated diamond mines of Golconda have not been worked out; and the explorations of Mr. George Henwood establish the fact that on accessible slopes of the Himalayas metals and minerals abound. Passing to Australia, wonderful developments are being made. The gold mines of Victoria are now pretty well ascertained. Of course, every spot of mining ground is not occupied, and will not be for many years to come; even about Ballarat and Geelong there is unbroken ground where the gold quartz sleeps. Lately some valuable diamonds, and also topaz stones, have been found in the colony.

In New South Wales there have been found fresh discoveries of gold, and some excellent topaz have been found, quite a new stone to obtain there as well as in Victoria. The most promising British colony is Queensland. It is four times the size of France before the late cessions, and 12 times the size of England and Wales. Gold is obtained there in 16 places. A bonus of land is given to everyone who discovers a paying mine; this has quickened search and promoted discovery. In New Zealand a bonus of from 200*l*. to 1000*l*. is given by Government to persons who discover workable mines; the effect has been several discoveries forthwith.

Within the limits of the United States of North America the rage for mining is extraordinary; the finds, especially for gold in California proper, and silver in Colorado, Nevada, and their neighbourhood, absolutely wonderful.

In Mexico new silver mines have opened up. In various parts of South America silver and copper mines have been "tapped" with success. In fact, where it can be demonstrated that there is a good mine, it may be inferred that the ground in the vicinity, allowing for exceptional circumstances, is metalliferous. Thus, turn to what quarter we will, new and accessible fields of metalliferous treasure are awaiting the miner's foot, or already springing into life and vigour beneath his hand.—*Gresham House, April 27.* THOMAS SPARGO.

MINING, AND ITS TENDENCIES.

SIR,—The magnitude of the national interest involved in mining—an industry no longer stationary, but progressive, happily and in a great measure through the medium which the *Mining Journal* affords for the expression of opinion upon that great industry, induces me again to communicate through its columns incidents of material benefit to the community at large. The proverb still holds good—"a pity 'tis 'tis true"—that spontaneous benefits lead to treacherous memories, and are soon forgotten; therefore, is it the more incumbent on all acquainted with the circumstances from which they arise not to allow the remembrance of them to rest in abeyance. Mining has tendencies which, fraught with good, are recognisable through all parts of the United Kingdom where its resources are subjected to the natural test of labour. In those districts proved to be mineralised we find industrial classes drawn, as it were, into a common centre, their social necessities ever prompting the exercise of the mental and physical powers, and thus urged to provident industry, hands which would have been under other circumstances inert are actively employed in utilising everything within their reach. Here sterility is changed to fertility; there habitations arise where loneliness and desolation once existed; homes with happy hearths, the dearest possessions of our people, are established, hundreds of human beings, the children of toil, congregate in peaceful fellowship thus mustered by enterprise upon the hills and in the valleys which else were a wilderness. And what is the sub-Providence which strews manna for them in the desert?—Mining. Such scenes as these are to be seen every day, and this fact, conceded as an unquestionable evidence of a national benefit conferred, I pass on to closer proximity with those who, having large means at their command, may not deem it foreign to them to support industry capable of such results, particularly when such support cannot well fail to be essentially remunerative to themselves. Well, that is not out of reason; we all like to receive in fair dealing the *quid pro quo*. But at this point probably a few general suggestions will not be out of place.

Would it not be wise of capitalists, large and small, to study this, that, and the other picture, which a visit, for instance, to Cornwall will discover to them? To learn practical lessons from industrial topography, let them take a peep at, for instance, the Helston district, St. Just, Camborne, Redruth, St. Agnes, Perranzabuloe, St. Austell; and in Devon, Tavistock, Tamar, and various other sites. While to set a seal of endurance on the knowledge thus acquired the trip extended to Wales would be highly conducive to Montgomeryshire, Cardiganshire, and Flintshire, would ensure that beneficial consummation, and I venture to say mining to them would no longer be a myth. Particularly if the rough computation would be entertained that taking the working mines of the United Kingdom, and they might be told by hundreds, the money dispensed by them to labour ranges in amount from 50*l*. to 1000*l*. per week, and this must be considered a low estimate. Surely the returns that achieve even this feat cannot be considered equivocal or uncertain. They are the great facts of the day, patent to all who seek them, and, what is more fortunate still, their value is progressive, and is being profitably made so. In the Principality, so long neglected, we have daily proofs of what a comparatively partial support is required to improve the state of mining districts. We have only to observe the number of new setts that have sprung up in the Van, Llangynog, Bwich Consols, Bronfloyd, Tankerville, and other mine circles, many of them proving prizes, such as East Llangynog, Aberdaunant, and others. And now, Sir, unwilling to intrude further on your valuable space, I conclude by reiterating the suggestion that capitalists of every degree should in their own interest study with attention Mining and its Tendencies.—*Vincat utilitas.* J. P. ENDEAN.

Gracechurch-street, April 27.

WHEAL GRENVILLE, AND SOUTH CONDURROW.

SIR,—In the third paragraph of my letter in to-day's Journal, instead of "unimportant to Grenville," it should have been "*comparatively* unimportant."

St. Michael's-alley, April 22. J. Y. WATSON.

SOUTH CONDURROW, AND WHEAL GRENVILLE.

SIR,—I see that Mr. J. Y. Watson will not allow this subject to drop, and I also perceive that he continues in a fog as far as South Condurrow is concerned. However, "if ignorance be bliss 'tis folly to be wise." I shall not again go over my statements made in the Journal of April 15, as I think they are quite sufficient for the satisfaction of the shareholders of South Condurrow, and I have no desire to disturb Mr. Watson's happy delusions. In fact, I will admit for his encouragement that there is a possibility that South Condurrow lodes may, "one and all," at some depth or other, pass into Wheal Grenville; but we must not omit to take into consideration that from some cause or other, respecting which different geologists hold completely different opinions, the heat of the earth increases regularly with increased depth, so that it will be impossible to carry on mining operations below a certain point. It is possible that this central heat may interfere with the realisation of Mr. Watson's dream.

Mr. Watson will, I trust, excuse my replying to any further remarks of his on South Condurrow.—*South Condurrow, April 25.* WM. C. VIVIAN.

PEN'ALLT SILVER-LEAD MINING COMPANY.

SIR,—During the last twelve months I have frequently read in your valuable Journal the most promising accounts of the condition and future prospects of the above mine, as reported from time to time by Capt. Glanville and the directors; and just now, when anticipating such results in the shape of profit, it is not a little mortifying to receive a copy of the report of their meeting, recently held, showing that the money is not only all spent, but that the large quantity of ore "seen by the directors" on the dressing-floors some months ago has by some mysterious agency disappeared, and found a resting place in the bed of the river, "distinctly visible to the naked eye." If such is really the case, I would advise the directors to confer with some eminent engineers as to the best means to be adopted for getting not only the ore out of the water, but the money also from those persons who they say in their report "are indebted to the company on account of shares." A most improper admission, I think; and one which shows the necessity on the part of outside shareholders for more stringent investigation by them as respects their own interests. Whether the non-success of the Pen'Allt Mine is attributable to the negligence of Captain Glanville, or the mysterious disappearance of the ore from the mine, the directors say they cannot inform us, and if such is really the fact, then the term "Limited Liability" may read to mean "unlimited mismanagement"—in the opinion of—

AN UNFORTUNATE SHAREHOLDER.

WEST DRAKE WALLS MINE.

SIR,—I have heard several shareholders in this mine speak approvingly of the letter of "Bona Fides," in last week's Journal. Although interested in the mine, I cannot pretend to be sufficiently informed to give an opinion as to the efficiency of the management; but as the plain queries of your correspondent obviously imply that there are grounds for enquiry, it is to be hoped that without waiting to be urged to it the purser and manager will feel it due to their own character, as well as to the reasonable anxiety of the adventurers, to give clear and explicit explanations on all the points raised. I have also heard it mentioned that there is a great necessity for infusing more energy into the working of the mine. Cannot some of the practical shareholders who will be present at the meeting on May 2 enquire into this? One thing is certain, there is much discontent among the adventurers with reference to the management and working of the concern. People say we want a little vigour thrown into the affair in order to arrive at some practical results. I desire to record and call attention to the fact of such remarks being made, without for the present pronouncing upon the justice of them. N. C.

HARMONY AND MONTAGUE (REDRUTH).

SIR,—I am quite rejoiced to know that these old mines are about to be reworked for tin, of which I know now, as an old miner, vast quantities may be raised. I did not know it when a lad, or the capels would never have been left for others. As I understand a strong and spirited company are about to undertake the concern—for speculation it is not—allow me to suggest that they make cross-cuts at the adit level, when, as an old practical miner, I think they will find something they little expect—a fine copper lode that has never been touched except at the surface, where it has been laid open for many fathoms; as far as seen it has tin on the back, but from the gossan I feel quite sure that there is a lot of copper under. This lode is one of the great lodes that have been so productive east and west, and has been heaved by the great elvan between these setts and North Downs.

I had not the money nor the influence to resuscitate these glorious old mines, but if the present promoters will take my advice they will at once adopt the measures they propose, and I hope will act on my advice, and cross-cut the sett. I treat the subject as an old miner from the neighbourhood. "I never knew a cross-cut go a begging" is an old mining maxim. There never was a finer chance than in these mines. Another thing I like in the affair is that they fall back upon the old system of 64 shares at 50*l*. each, thus excluding men of straw. Those who cannot afford 50*l*. have no business to go mining. This, I hope, will prove an example that mining proper is not gambling, as is too frequently supposed. I have applied for a share, which is the extent I am able to command, and hope the mine will be conducted on mining principles; if not I shall, if allotted the share, drop it like a hot potatoe, and inform my fellow-sharcholders of any misstatements or faults that I can find.

AN OLD AND FORTUNATE MINER.

(I enclose my name as a voucher, but do not want it to be put before the public.)

[The writer of this letter is well known to us. We hope his sanguine ideas may be realised. If experience goes for anything, he certainly has that in his favour.]

ST. JOHN DEL REY MINE.

SIR,—As many enquiries have lately been made respecting this mine, permit me to explain the former and present position of the undertaking. The facts stand thus—about two years since the mine was in a very prosperous condition. I believe the shares, with 15*l*. paid, stood at 80*l*., and on this amount large and handsome dividends were periodically declared. The mine was looking exceedingly well, with good reserves and increasing returns; unluckily, a fire took place in the main shaft, destroyed the timber, and the shaft collapsed. At that time a reserve accumulated from profits alone of, I think, above 200,000*l*., was in hand, and with this sum a new shaft is being rapidly sunk; and in the course of 12 months or thereabouts it is believed it will be finished, and the former returns and dividends be resumed. In consequence of this accident the shares fell from 80*l*. to 24*l*., since which they have reached 33*l*. There is no reason to doubt but that the old prosperous position will be regained, as the mine is known to be a *bona fide* rich concern. Unlike mines where no discoveries have been made, St. John del Rey has opened up and contains resources rarely equalled, which accounts for the shares being sought after at the so-called premium.

A SUBSCRIBER.

[For remainder of Original Correspondence see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

There is, unfortunately, no change for the better to report in the condition of the Belgian coal trade. The depression in affairs seems to be increasing rather than otherwise, and threatens to culminate in a crisis. The owners of several collieries, in presence of a stock which has been accumulating for some months past, an almost complete absence of orders on foreign account, and a comparatively small home demand, have been obliged to dismiss a part of their workpeople; and should the present state of affairs be prolonged other coalowners must follow their example. There has not, at the same time, been any great reduction in prices, a circumstance which at first sight might appear rather strange, but which is due to the fact that under present circumstances a fall in prices would not stimulate orders, the Belgian industrial establishments being, as has been already observed, somewhat abundantly supplied with coal. A reduction would, in fact, in the present state of affairs be a sacrifice, without any attendant compensation, while it does not appear to be demanded generally by industrials. Several firms on the right bank of the Meuse, between Liége and Visé, supported by the Liége Union of Collieries, Mines, and Metallurgical Establishments, have addressed to the Belgian Legislature a petition, in which they solicit a canalisation of the Meuse between the barrage of the cannon foundry and that of Hermalle-sous-Argenteau. An audience has been granted upon this subject by the Minister of Public Works to certain delegates of the Collieries, &c., Union. The Minister is understood to have promised the execution of the works in question, which are of importance in connection with the industry of the Liége basin.

The present condition of the Belgian iron trade is much more satisfactory than that of the Belgian coal trade. Not that there is any remarkable activity prevalent at the ironworks, but there is a good current of orders, so that industrials are enabled to await without much uneasiness a restoration of tranquillity in France, when a further general revival in affairs may be hoped for. It appears that in the second half of last year the Great Luxembourg Railway Company expended 14,334*l.* in the purchase of 150 trucks; the company also purchased six new locomotives and tenders for 12,670*l.* The company has still on hand a considerable further expenditure for additional rolling stock. In 1872 and 1873 it is proposed to expend 33,000*l.* under these heads. The line is also to be doubled at certain points, at an estimated cost of 88,700*l.*, and 12,000*l.* is to be expended in the construction of some additional workshops. It appears that there are now in working in the Grand Duchy of Luxembourg seven blast-furnaces of large dimensions, three of average dimensions, and seven of small dimensions. Six blast-furnaces, all of large dimensions, are also in course of construction. At Longwy and in the neighbourhood there are seven blast-furnaces of large dimensions, and fifteen of small dimensions. There are also three blast furnaces of extraordinary dimensions in course of construction; these latter will be ready to be lighted in a few months. Each of the seven large furnaces now at work produces from 1500 to 2000 tons of iron per month, and consumes about 2500 tons of coke per month. It appears that in the quarter ending March 5, 1871, the Belgian Government purchased 3000 tons of Vignoles rails, rolled by the ordinary process, to meet the requirements of the Belgian State Railways. These rails, which were purchased at an average price of 6*l.* 18s. per ton, were ordered from the Marcinelle and Couillet Works, MM. de Dorlodot Frères, of Acoz, MM. Blondiaux and Co., of Thy-le-Château, the Montigny-sur-Sambre Ironworks Company, the John Cockerill Company (Seraing), the Sclessin Works, the Monceau-sur-Sambre Works, the Zone Works, and M. Boucqueau, of La Louvière. The Bonne Espérance and Batterie Collieries Company will pay on May 1 a second dividend for 1870 of 4s. per share. The report of the Belgian United Shares Company states, with regard to the Ougrée Ironworks Company, that the results of the year's working, after important redemptions of capital had been made on sinking fund account, admitted of the declaration of a dividend of 1*l.* per share, or 4s. per share more than during the preceding year. The events which have weighed during the last few months upon most industries have thus not affected the Ougrée Ironworks Company, and it is expected that the financial results of 1870-71 will not be inferior to those of 1869-70. The Espérance Collieries, Blast Furnaces, and Rolling Mills Company felt, on the contrary, during the last few months of the exercise 1869-70, not only the general influence of the war, but also its direct consequences. Communications with the East of France were interrupted on the outbreak of hostilities, and it was impossible to execute important contracts for coal and coke which had been concluded with metallurgical establishments on the Moselle. All that the Espérance Company was, under these circumstances, enabled to effect during the past exercise was the payment of interest upon its preference shares.

Correspondence from Aix-la-Chapelle states that the rolling mills have a good deal to do to meet the requirements of the railway interest, but that in other respects the German iron trade is not doing much at present. Wheel manufactories are active, and find it difficult to obtain sufficient labour. Machine and engine factories have suffered a good deal from the war; up to the close of last year they were kept going upon old orders, but since then orders have made default until the last month, when symptoms of a revival in business presented themselves.

Business in copper has presented little activity at Havre; at the the same time there are a few transactions to note. Thus, 1320 tons of disposable Chilian in bars have changed hands at 66*l.* per ton, Paris conditions. Another lot of 12 tons has been dealt in upon similar terms. At Marseilles, Toka has been dealt in at 70*l.*; Spanish at 68*l.*; refined Chilian and Peruvian, at 72*l.*; and rolled copper in sheets at 80*l.* per ton. On the German markets the article has displayed somewhat more firmness; there have not, however, been any very great variations in quotations. At Rotterdam there has been scarcely any change in prices, Drontheim being quoted at 50 fls. to 52 fls. At Marseilles, Banca tin has been dealt in for consumption at 144*l.* per ton, and English at 150*l.* per ton. At Hamburg quotations have somewhat hardened. At Rotterdam tin has remained inactive; Banca has been dealt in at 76¼ fls. to 76½ fls., and purchases might probably be concluded at 76 fls. Disposable Billiton is offered at 76 fls. At Marseilles, lead in saumons, first fusion, has made 18*l.* per ton; ditto, second fusion, 17*l.* 12s.; ditto, in shot, 20*l.* 8s. per ton. At Berlin the article is in good demand. At Hamburg there has been no great amount of business passing in lead; at the same time, prices have been sustained. At Rotterdam lead has presented no change. At Marseilles rolled zinc has made 28*l.* per ton, with a discount of 3 per cent. On the German zinc markets there has not been much doing; holders would probably make concessions to effect sales.

FOREIGN MINES.

DON PEDRO NORTH DEL REY.—Telegram from Lisbon: Produce to 29th March, 4179 offs.; estimate for March, 5679 offs.

ALMADA AND TIRITO (Silver).—The directors have received the following telegram from Mr. Clemes, dated March 20:—"February, profit for month, $5670. Width of Tirito lode 30 ft. Looking well."

ECLIPSE (Gold).—The directors have received the following telegram, dated Aurora, Nevada, April 15, from Mr. Henry Tregellas, the manager of the mine:—"Commenced crushing quartz to-day." It is understood that operations have been commenced with ten heads of stamps, worked with patent atmospheric machinery. According to latest advices, a large quantity of ore was ready for stamps. The 42-stamp mill is expected to be at work on June 1.

COLORADO TERRIBLE LODE.—The directors have received the following from their agent, dated Georgetown, April 2:—"Yesterday, in cutting a hitch for a stull timber, a new vein of mineral was discovered lying immediately back of what was supposed to be the south wall of the lode, commencing about 25 ft. above the bottom. Immediately commenced blasting, and took down in a few hours what will make 1½ ton of first-class ore. The vein was wedge-shaped, thin at top and thick at bottom, where it is now showing from four to six inches, and even much more in one place. The winze carried down a good vein of ore, so the new vein is all extra."

BIRDSEYE CREEK (Gold).—J. A. Stone, April 4: I took possession of the property of the Birdseye Creek Gold Mining Company on March 30, and at once commenced running the Brown's Hill Mine night and day, and shall continue to work it vigorously, and I trust with results which will be satisfactory to the company. I shall not work at Red Dog Mines at present, but concentrate the water on the Neece and West and Brown's Hill Mines. Owing to the condition in which I found the Neece and West Mine, I found it necessary to make some changes and improvements, and shall not be able to commence washing on them for two or three days, but shall work them much more vigorously than they have been by the former owners. Yesterday I went to Dutch Flat and purchased a "dictator" (one of the best improvements in nozzles and discharge pipes). I am moving the pipes from the Red Dog Mines, and placing them on the Neece and West, and shall have two rigs, so when it is necessary to shut one down to run powder drifts I can be washing with the other, the face of the tank being of sufficient width to admit of it. If the flumes were of sufficient width I could run both rigs at the same time. The ditch is running its full capacity at present. The season so far has been unusually dry, but we are in hopes to have late rains, which will prolong the water season. I shall send you weekly communications, and at the end of every clean up send a statement of gross receipts, expenses, and vouchers. Upon taking possession I found so much resting on me that I have not been able to make a report, but will do so at my earliest convenience.——G. D. McLean, April 1: I truly believe you have made a good purchase, that the property will prove remunerative, and I know that it will last until we are all dead.

CAPE (Copper).—Capt. Williams, March: Ookiep: Cutting of plat at the 48 is completed, and we have resumed the sinking of the engine-shaft and cutting a tip-plat below the said level, in a good course of copper ore, that will yield about 6 tons per fathom, by six men and three labourers, at 50*l.* per fm. for the shaft, and 10*l.* per fathom for the plat. The 48 east has been extended during the past month 2 fms. 1 ft. 9 in., in a good course of copper ore, that will yield about 6 tons per fathom; the end at present is poor, and we have put the men to drive south on the flookan course towards the winze sinking below the 40; it will yield from 5 to 6 tons per fathom; set March 4 to three men and three labourers, at 20*l.* per fathom, for 2 fms. or the month. The 48, west from the engine-shaft, has been extended during the month 1¾ fm., in a splendid course of copper ore, that will yield about 7 tons per fathom; the end at present is worth from 9 to 10 tons per fathom; we have put the men to drive north towards No. 6 winze, sunk 7⅛ fms. below 40; this end will yield from 9 to 10 tons per fathom; set March 4 to three men and three labourers, at 20*l.* per fathom, for 2 fms. or the month. No. 8 winze, sinking below the 40, on the flookan course, will yield about 6 tons of copper ore per fathom; ground sunk during the month 2¼ fms.; set March 4 to two men and two labourers, at 18*l.* per fathom, for 2 fms. or the month. The 40 south-west, during the past month, has been extended 2 fms. 0 ft. 7 in., in ground that will yield about 2 tons of rich copper ore per fathom; at present it is worth from 2 to 3 tons per fathom, and looking very promising to improve; this end is letting out a great deal of water, which is a good indication.—New: The stope in back of the 30, north-east from No. 2 winze, will yield about 5 tons of copper ore per fathom; set March 4 to two men and four labourers, at 3*l.* per fathom, for 15 fms. or the month.—New: The stope in bottom of the 20, north from No. 3 winze, will yield about 6 tons of copper ore per fathom; set March 4 to one man and three labourers, at 2*l.* 15s. per fathom, for 20 fms. or the month. The stope in back of the 30, north of No. 3 winze, on the flookan course, will yield about 4 tons of copper ore per fathom; set March 4 to two men and four labourers, at 3*l.* per fathom, for 20 fms. or the month. The machinery is working well, and everything going on satisfactorily in each department of the mine. The new miners are working well, and, so far, appear to be very steady.

RETURNS.—Yield: Ooklep, 517 tons; Spectakel, 96 tons; from blast-furnace, 50 tons regulus; from reverberatory-furnace, 51 tons of regulus. Transport to Port Nolloth, 122 tons of regulus, 244 tons of ore; to Hondeklip, 48 tons of ore. The smelting-works had been delayed by heavy rains interfering with the furnaces and machinery, but regular work had been resumed. Bills of lading are forwarded for 600 tons of ore and regulus per Tacna.—[Since last notice 850 tons of ore have been sold by public ticket, at an average of 13s. 1½d. per unit; 600 tons, ex Antonio Vinent, are put forward for next ticketing. The Patagonia, with 431 tons, has arrived at Swansea.]

[For remainder of Foreign Mines see to-day's Journal.]

Meetings of Mining Companies.

GENERAL MINING ASSOCIATION.

The half-yearly general meeting of shareholders was held at the company's offices, Old Broad-street, on Wednesday,

Col. E. W. SCOVELL in the chair.

Mr. J. B. FOORD (the secretary) read the notice convening the meeting, and the minutes of the preceding meeting were read and confirmed.

The CHAIRMAN remarked that the circular which had been forwarded to the shareholders would have explained to them how the directors were unavoidably obliged to postpone the presentation of the accounts. It had been determined, as they were aware, at the previous meeting to re-value the whole of their property in the colony, and as they had not received the statements of the results of that valuation the accounts of the company were necessarily in an incomplete state, and the auditors had agreed with them that it was better to defer the presentation. Under these circumstances, the meeting would have been entirely *pro forma*, but that by the peculiar wording of their Articles of Association the directors went out of office upon the adjournment of the meeting. The provision was an inconvenient one, but was the same as was in force under their old deed, on which their present articles were based. They would have before they separated to fix the date of the adjourned meeting, but at present he would ask them to proceed with the election of directors. There were no new candidates who offered themselves for the office, but the directors who retired by rotation were all willing to serve again if the meeting re-elected them.

Mr. George Scovell was then unanimously re-elected upon the proposition of the CHAIRMAN, seconded by Mr. BISCHOFF, and Mr. Henry Boggs was also unanimously re-elected.

Mr. F. W. BIGGE had much pleasure in proposing the re-election of Col. E. W. Scovell as a director of the company. Col. Scovell had rendered very valuable services to the company, and was a most useful member of the board.——Mr. J. C. RUDING was happy to have the opportunity of seconding the re-election of Col. Scovell. The resolution was put to the meeting, and carried unanimously.

The CHAIRMAN proposed, and Col. WESTERN seconded, the re-appointment of Mr. C. Lee Nicholls as auditor, and the resolution was unanimously carried.

The meeting was then declared adjourned until Tuesday, June 27, and the proceedings terminated with the usual vote of thanks.

TAN-YR-ALLT MINING COMPANY.

The third general meeting of shareholders was held at the London Tavern, on Wednesday,

Mr. WILLIAM NEWLAND RUDGE in the chair.

Mr. HODGSON, jun. (the secretary), read the notice convening the meeting, and the report of the directors was also read.

The CHAIRMAN said the present financial condition of the company had arisen entirely from the incontrovertible, but regretable, fact that the shareholders had not kept the promise they made at the last meeting—that if the directors subscribed for a certain number of shares at 3*l.* each the remainder would be accepted by the shareholders at 2*l.* 10s. The directors had been faithful to their engagement, and had each taken 150 shares at 3*l.*, but out of the remaining 1250 the shareholders had subscribed for less than 200. He confessed that the directors felt themselves much aggrieved, at which no consistent shareholder could be in any way surprised. The result was that the mine had not been developed to the extent, nor upon the scale, to which—according to all practical testimony—its capabilities warranted, and now just as they were, apparently, on the very eve of testing its value, where alone the actual resources of the property could be proved—that is, in depth—the directors were compelled to again ask the shareholders in what way the necessary capital should be provided. The directors already held among them one-third of the entire shares into which the company was divided, and, therefore, could not be expected to do more, although, as far as the mine was concerned, they had the strongest reasons for believing that its future development would prove Tan-yr-Allt to be all that he had expected of it. With those few remarks he would move that the report and balance-sheet be received and adopted.

Mr. LINDOW seconded the proposition.

Capt. JOHNS, the manager, in reply to questions, stated that comparatively speaking the mine was as yet undeveloped. They were only down some 20 fms. from surface, and at the deepest point the lode had not been cut through. No depth had been attained to prove such a large and masterly lode. There were about 30 tons of lead, which would be marketable in about a month, and there were about 50 fms. of ground in back of the 24, which was worth from 1 to 1½ ton per fathom; so that they might fairly calculate there were 50 tons more yet to come—that is, if it turned out according to expectations.

Mr. W. GUNDRY said the "sump" was down to the 34, but the object for which it had been sunk was as yet unattained. Besides this they were sinking the shaft on the unproductive part of the lode, which, it should be remembered, was very large and masterly. The part standing north was the most productive, and that part they had not seen for the last 10 fms. sinking. If a course of ore should be cut at that point the mine would be made. He might add that a letter had been received that morning from Capt. Harris to the effect that at the bottom of the shaft the prospects for lead were favourable, and that there were good chances of cutting the lode good at the 34. At this important juncture in the development of the mine it would be a thousand pities to allow others to come in and reap the advantages of the capital expended by the present shareholders, for, as the Chairman had said, there was a great chance of opening up a productive mine in depth.

Capt. JOHNS, replying to further questions, stated that cross-cutting towards the lode at the 34 would be commenced at once, and the part gone through in the 24 was as fine a lode as could be seen.

Mr. W. GUNDRY said there could be no doubt whatever that as yet they were much too shallow for large deposits of ore.

Capt. JOHNS said that shareholders would not be acting justly to themselves to think of abandoning the mine until they had seen what this enormous lode was going to do in depth. To carry out the points suggested in his report—that is, sink both shafts, and drive the cross-cuts—would cost about 200*l.* per month.

The CHAIRMAN said that, by the articles, the directors possessed the power to raise money by mortgaging the property of the company, but had hesitated to exercise that power without first consulting the shareholders. It was now for the shareholders to say what course should be adopted. The directors were quite willing to lend a portion of the money upon a mortgage of the mine, provided the shareholders would come forward and assist them in that respect, but they would not do so without the shareholders expressed a wish to that effect.

Mr. BAWTREE said the mine certainly looked favourable for opening out well, and he suggested that the necessary capital should be raised for that purpose.—The report and balance-sheet were received and adopted.

The retiring directors, Messrs. W. Gundry and W. G. Margetts, were unanimously re-elected.

Some discussion ensued, which resulted in the proposition from Mr. WHITE, seconded by Mr. BAWTREE, that the directors be requested to exercise the powers contained in the Articles of Association in such a way as they may think best. The motion was put, and carried unanimously.

A vote of thanks to the Chairman and directors terminated the proceedings.

ASSHETON MINING COMPANY.

The third general meeting of shareholders was held at the London Tavern, on Tuesday,—Mr. WILLIAM N. RUDGE in the chair.

Mr. F. HODGSON, jun., (secretary), read notice convening meeting.

The report of the directors stated that further capital is required for profitable development. The directors, having consulted some of the largest shareholders, propose to do this by the issue of debentures to the sum of 5000*l.*, to be fully called up only as occasion requires.

The CHAIRMAN moved the adoption of the report, and stated that Capt. Johns, the manager of the mine, was present, and would afford the shareholders any information beyond that contained in his report that they might require. He further stated that for the proper development of the mine further capital would be required, and that the directors proposed to raise the sum of 5000*l.* by the issue of debentures, so that when the company came to be in a paying position it might pay them off, and might go on working new lodes, and increase the property every day. The whole of the 5000*l.* would not be called up at once, but only as required.

Mr. H. D. BROWNE seconded the resolution.

Capt. JOHNS, by means of a section, explained, in answer to questions put to him by Mr. J. I. Courtenay, the position and nature of the different shafts and lodes, and the chief points of operation, which were considered very satisfactory.

The motion adopting the report and balance-sheet was put to the meeting, and, after a discuesion as to the advisability of sending a civil engineer to inspect and report upon the mine, with which the Chairman, directors, and Capt. Johns readily concurred, was carried unanimously. It was then resolved that a competent mining engineer should be requested to inspect the mine, and report upon the best method of working it in future. The retiring directors, Messrs. W. N. Rudge and H. W. Lindow, were unanimously re-elected.

The CHAIRMAN, in returning thanks, stated that the debentures would be issued at 10 per cent. interest, the directors being bound under the Articles of Association to issue them at par, and pay them off at par.——A cordial vote of thanks to the Chairman for presiding terminated the proceedings.

At East Carn Brea Mine meeting, on April 21, the accounts showed the arrears of calls to be 364*l.* 17s. 11d. It was resolved, that a special general meeting should be held on May 2, for the purpose of considering the propriety of disposing of the mine as a going concern; or, in the event of no sale being effected, to suspend all operations, to realise the assets, and finally to wind-up the affairs of the company. Capt. John Rodda, in his report, says—"I enclose a tracing of Fox's, or the south part of our sett, showing the adit level on the great tin lode, which is Wheal Uny main lode, and yielding good profit. We can follow this lode down about 80 fms. below adit, or over 100 fms. from surface, and considering we have got this immense lode in our sett for upwards of 200 fms. long, I am strongly of opinion good profits will be the result of its development, and it can be done cheaply, as the water will not be much, a rotary engine being sufficient for pumping and drawing the stuff. A great deal of work may be done by simply erecting a horse-whim, and I think some tribute may be let at once. This ground is all the more kindly, seeing that a great many hundreds of pounds worth of tin has been raised about the adit, and Wheal Uny eastern ends (which are reported to be looking well) must be fast approaching our boundary, therefore I would recommend that operations be commenced on this champion lode forthwith. The probable cost for the next two months will be about 350*l.*"

[For remainder of Meetings see to-day's Journal.]

EAST TERRAS MINING COMPANY.

We subjoin a communication from Mr. GEORGE HENWOOD, so well known in the mineralogical and mining world, as to this property. He exhibits in a brief compass its qualities and conditions:—

April 25.—The sett forming the basis of your undertaking is very extensive, being more than ¾ mile on the course of the lodes east and west, and about the same extent north and south. It is separated from the now justly celebrated Terras Tin Mine, on the west, by a small river. It may be stated at once that the success of the Terras Mine was the reason for adopting the title, and the formation of the East Terras Mining Company. The fact that the whole, or nearly all, the more important lodes—the east and west of the Terras—traverse the entire sett, are intersected by, and associated with, cross lodes and elvan dykes precisely analogous to the rich mines of the district, must be deemed satisfactory and sufficient evidence of the value of East Terras sett. To this statement may be added that the strata—clay-slate or killas—and geological position are identical, on the southern slope of one of the great granitic bosses of Central Cornwall. On the west, adjoining the Terras, on the same run of lodes, is the Blencowe Mine, which had been very productive of tin some years ago, and is now about to be worked in a spirited manner. Some of the most powerful machinery in the county is now being erected for the purpose of drainage, a convincing proof of the estimation in which the locality is held. On the east, adjoining, and on the same series of lodes, are the Wheal Marshall, Forteseue, and Great Dowgas Mines; the two former are also about to be vigorously prosecuted. In order to test the fact, and to afford indubitable proof of the existence of these lodes in the East Terras sett, an extensive series of costeaning shafts and pits have been made in every direction at the points indicated by careful dialling and calculations based on long experience, the lodes have been found; these works have been executed by the present company. To thoroughly develope this ground, peculiar advantages are afforded by its physical character. An adit level may be driven on one of the east and west lodes, from which, on the contra lodes, must be cut by the adit or by short cross-cuts, the parallel east and west lodes being near each other; the whole may be drained and the ore extracted to the depth of between 30 and 40 fms., and enormous quantities of tin ore procured at the cheapest rate. No expense will be incurred for machinery beyond the appliances necessary to dress and bring the ore into a marketable state. By the time these are erected the adit level may be driven and supplies of tinstone raised. The lodes discovered and proved metalliferous are twelve in number, and there is every certainty of the East Terras proving a first-class tin mine. Good roads pass through the sett; the facilities for obtaining supplies of every kind and sending off produce cannot be surpassed. The terms of grant (21 years at 1-18th dues) are unusually liberal, so that I think I have shown that for a new project the East Terras is a mining property seldom if ever equalled.—GEORGE HENWOOD.

HARMONY AND MONTAGUE MINES, REDRUTH.

We have received the following report from Capt. JAMES POPE, of these mines. So far as appearances justify an opinion, the setts which constitute this mine are fraught with metallic treasure. Indeed, it is more than a matter of appearance, the phenomena presented are demonstrable as indications of solid mineral wealth. It appears evident from Capt. Pope's communication that these mines will soon be placed in their original position as amongst the richest in Cornwall:—

Redruth, April 22.—I have, according to your request, carefully inspected these mines, and beg to forward you my report. These old mines are situate in the centre of the greatest mining district of Cornwall, and are surrounded by the richest tin mines in the county. These setts were formerly worked for copper ore, of which large quantities were raised, and large profits made, to above 200,000*l.* At that time little or no attention was paid to tin ores in this locality, indeed copper miners at that time knew very little of tinstone; the same occurred at all the great tin mines in this district, all of them were once productive for copper ore, and are now being wrought for tin at great profits. It should also be understood that when last worked tin was sold at from 40*l.* to 45*l.* per ton, but at this time it is 75*l.*, or above. There are five or six known lodes traversing the whole length of this sett, and are explored nearly a mile in length on their courses, in addition to which are elvans and cross-courses forming junctions, at which points all the mines in this district make rich deposits of mineral. These lodes having been explored are from surface about 130 fms., the adit (included) being about 30 fms. from surface, and the water is now about 13 fms. below the adit, so that large quantities of tinstone can be raised without draining the water to any deeper level. One great advantage in working these mines is that the copper ore being taken away, and the tin capels are left standing for a considerable length, which are from 5 to 10 ft. wide, producing tinstone of average quality, and can be sent to surface very cheaply, as no pumping machinery will be required for the present. I would strongly recommend that a powerful stamping engine be erected at once, and the tin floors laid out on an extensive scale, so that large quantities of tin can be pulverised as quickly as possible, the returns from which will leave handsome profits to the shareholders. In conclusion, I beg to state that in all my experience I never met with such a piece of tin mining property lying idle as these mines present, which will produce such results for such a small outlay, it being only necessary to erect powerful stamping machinery to enable you to send large quantities of tin to market at once.—JAMES POPE [late manager of Wheal Basset, Treseavan, and other mines.]

LUBRICATORS.—The invention of Mr. W. GEE, New York, consists in providing below the reservoir, the feed regulating device, and the contracted orifice, through which the oil escapes from the reservoir, a chamber of such capacity that the oil or other lubricating material drips through the chamber instead of trickling down over the surface of the passage leading from the reservoir and feed-regulating device to the bearing or other device to be lubricated, such chamber having openings in its sides, or being partly constructed of glass, thereby enabling the dripping of the oil within or through it to be distinctly seen. In order to ensure the dripping instead of the trickling of the oil or lubricating material from the reservoir through the chamber, a teat is provided around the orifice, through which the oil or lubricating material passes into the chamber.

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